1400 South 19th Avenue
Bozeman, MT 59718

April 30, 2014

To: Governor's Office, Sheena Wilson, State Capitol, Room 204, P.O. Box 200801, Helena, MT 59620-0801
Environmental Quality Council, State Capitol, Room 106, P.O. Box 201704, Helena, MT 59620-1704
Dept. of Environmental Quality, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901
Dept. of Natural Resources & Conservation, P.O. Box 201601, Helena, MT 59620-1601
Montana Fish, Wildlife & Parks:

Director's Office	Parks Division	Lands Section	FWP
Commissioners	Fisheries Division	Legal Unit	Wildlife Division
Design & Construction			

MT Historical Society, State Historic Preservation Office, P.O. Box 201202, Helena, MT 59620-1202
MT State Parks Association, P.O. Box 699, Billings, MT 59103
MT State Library, 1515 E. Sixth Ave., P.O. Box 201800, Helena, MT 59620
James Jensen, Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624
Janet Ellis, Montana Audubon Council, P.O. Box 595, Helena, MT 59624
George Ochenski, P.O. Box 689, Helena, MT 59624
Jerry DiMarco, P.O. Box 1571, Bozeman, MT 59771
Montana Wildlife Federation, P.O. Box 1175, Helena, MT 59624
Wayne Hurst, P.O. Box 728, Libby, MT 59923
Jack Jones, 3014 Irene St., Butte, MT 59701
Beaverhead Conservation District, 420 Barrett Street, Dillon, MT 59725
U.S. Army Corp of Engineers, 10 West 15th Street, Suite 2200, Helena, MT 59626-9705
U.S. Fish and Wildlife Service, 585 Shepard Way, Suite 1, Helena, MT 59601-6287
U.S. Fish and Wildlife Service, 420 Barrett Street, Dillon, MT 59725
Big Hole Watershed Committee, P.O. Box 931, Butte, MT 59703
Montana Trout Unlimited, P.O. Box 7186, Missoula, MT 59807
Skyline Sportsmen, PO BOX 173, Butte, MT 59701
George Grant TU, P.O. Box 563, Butte, MT 59702

Ladies and Gentlemen,

The enclosed decision notice has been prepared for the proposed South Fork Sixteenmile Creek Westslope Cutthroat Trout (WCT) Recovery Project. FWP and Gallatin National Forest (GNF) proposed to construct a fish passage barrier, remove hybridized westslope cutthroat trout using a piscicide (rotenone), and re-introduce genetically pure westslope cutthroat trout from nearby wild population.

Comments to the Draft Environmental Assessment were received from 12 parties during the public comment period (7 February to 7 March 2014). Comments were also received during two public meetings held on February 18, 2014 (Bozeman) and February 20, 2014 (Sedan). Seven people attended the meeting in Sedan, and 21 people attended the meeting in Bozeman. Public notification of the EA and public meetings was provided in the Bozeman Chronicle and the Livingston Enterprise.

Based on concerns expressed by some downstream landowners, it is my decision to modify the proposed project presented in the Draft Environmental Assessment. The modified project will selectively remove rainbow trout and significantly hybridized fish (<90% WCT genetics) and allow slightly hybridized fish (>90% WCT genetics) to re-colonize the stream above the constructed fish passage barrier, rather than completely removing the hybridized population and replacing it with a genetically pure population. This attempt to restore the WCT conservation population with >90% WCT genetics will be evaluated for 3 to 6 years. Annual updates will be provided to area landowners and the interested public to determine progress. If the evaluation determines that selective removal without the introduction of genetically pure fish is not effective, complete removal and re-introduction will be implemented as described in Alternative 2 of the Draft Environmental Assessment.

Questions regarding this Decision Notice should be directed to:

Ron Spoon
Fisheries Biologist
Box 1137
Townsend, MT 59644

Or emailed to: rspoon@mt.gov

Thank you for your interest.

Sincerely,

Patrick J. Flowers
Region Three Supervisor

ENVIRONMENTAL ASSESSMENT DECISION NOTICE

South Fork Sixteenmile Creek Westslope Cutthroat Trout Recovery Project

Montana Fish, Wildlife & Parks
Region Three, Bozeman
April 30, 2014

Proposed Actions

The proposed action is the removal of fish using rotenone, followed by reintroduction of nonhybridized westslope cutthroat trout transferred from a nearby wild source. Piscicide treatment will be limited to waters within the project area followed by a detoxification zone created by the release of potassium permanganate ($KMnO_4$). A separate yet essential component of this project entails construction of a barrier, which would be located about 16 miles upstream from South Fork Sixteenmile Creek's confluence with the middle fork. The GNF will prepare an EA for the barrier under their NEPA requirements. The purpose of the barrier is to prevent reinvasion of nonnatives and hybrids, which are abundant throughout the larger watershed.

FWP commitments to restore WCT populations at appropriate locations in Montana are, in part, based on the intrinsic values of this native species. In addition, FWP has more formal obligations to restore the species. Conservation of species like WCT is required by state law, and serves to prevent species from being listed under the federal Endangered Species Act. Title 87-1-201 (9)(i) of the Montana Code Annotated directs Montana Fish, Wildlife and Parks to manage wildlife, fish, game and nongame animals [and sensitive species section (9)(ii)] in a manner that prevents the need for listing under title 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq. Proposed work in the South Fork Sixteen Mile Creek reflects FWP carrying out duties as directed by Montana State Statutes.

Montana Environmental Policy Act

Montana Fish, Wildlife & Parks is required by the Montana Environmental Policy Act (MEPA) to assess significant potential impacts of a proposed action to the human and physical environment. In compliance with MEPA, a draft Environmental Assessment (EA) was prepared by FWP for the proposed project and released on February 7, 2014 for a 29-day public comment period, ending March 7. Two public meetings were held: one in Bozeman on February 18, 2014 and one in Sedan on February 20, 2014.

The draft EA was circulated to a standard FWP R-3 contact list, and to local landowners, sporting groups, governments, and federal agencies. The EA was also posted and remains available for viewing on the FWP webpage: http://fwp.mt.gov/news/publicNotices. A legal notice indicating release of the EA was sent to the Bozeman Daily Chronicle.

Summary of Public Comment and FWP Response

Comments received during the scoping process were important for preparing the alternatives presented in the EA.

Scoping letters were sent to 59 individuals, groups and agencies on 11 January 2013. Although only one written response to the scoping letter was received, several phone contacts indicated that there was significant landowner concern about the proposed project. In response to this concern, a public meeting was held on February 20, 2013 to present project objectives and receive feedback on project design and feasibility. Sixteen landowners, one grazing permittee, and one county commissioner attended the meeting or participated by conference call. Although the public was welcome to attend the meeting, the primary purpose of the meeting was to address landowner concerns and neighboring landowners were the only attendees.

Landowners listed several major issues during the public meeting in February 2013. These included concerns relating to the potential for alterations of the pristine nature of the area. Other raised concern about the effects on neighboring landowners. Specifically, they wanted to know the consequences of having a species near or on their property with the possibility of listing under the Endangered Species Act, the likelihood of associated restrictions on land use, and the probability for future, downstream expansion onto private lands. Landowners also questioned the potential for long-term persistence of an isolated population in small headwater streams. Accounts from landowners observing fish movement downstream of the GNF boundary during low, summer flow raised a specific concern about the viability of the headwaters fishery.

In response to questions raised during the landowner scoping meeting, FWP added three steps to the EA preparation process. FWP biologists met with individual landowners to explain the Candidate Conservation Agreement with Assurances (CCAA) tool to protect landowners from restrictions on land use in the future. They also provided names and phone numbers of landowners who had direct experience with WCT restoration projects. To address the concern about the viability of a headwater population during the summer months, FWP collected monthly (June through September) fish population data during the summer of 2013. Finally, FWP delayed the release of the draft EA for several months to make individual contacts with concerned landowners and evaluate summer fish movements during 2013 to address concerns about habitat suitability.

Summary of Public Comment and FWP Response

Twelve written public comments were received during the EA review period (ending March 7, 2014). Additional 5 comments were received during two public meetings. Twenty-one individuals attended the meeting in Bozeman, and 7 attended the meeting in Sedan.

Three commenters focused on the issue of rotenone use. This topic is extensively addressed in the following section (Issue 1). Three written comments expressed concern about problems with rotenone at Cherry Creek (Issue 2). Five written comments and several verbal comments focused on the value of the extisting hybridized population and the risk of replacing it with new fish (Issue 3). More specific issues were raised by commenters and these issues are also identified and addressed below.

Issue 1. The use of the piscicide rotenone including topics related to Parkinson's disease (PD); impacts on mammals, birds, and aquatic organisms; movement in groundwater; effects on the human eye; and current necessity for its use.

Background Information: As described in the EA, rotenone is a naturally occurring substance derived from the roots of tropical plants found in Australia, Oceania, southern Asia, and South America. Rotenone has been used by native people for centuries to capture fish for food in areas where these plants are naturally found. It has been used in fisheries management in North America since the 1930s. Rotenone has also been used as a natural insecticide for gardening and to control parasites such as lice on domestic livestock. Currently, several formulations of rotenone are Environmental Protection Agency (EPA) registered products for the removal of unwanted fish.

FWP has a long history of using rotenone to manage fish populations in Montana that spans as far back as 1948. The department has administered rotenone projects for a variety of reasons, but principally to improve angling quality or for native fish conservation. Rotenone acts by inhibiting electron transfer at the cellular level. It is especially effective at low concentrations (< 1 part per million) with fish because it is readily absorbed into the bloodstream through the thin cell layer of the gills. Mammals, birds and other non-gill breathing organisms do not have this rapid absorption route into the bloodstream, and thus can tolerate exposure to concentrations much higher than that used to kill fish. Gill breathing amphibians can be impacted by rotenone; however, this can be mitigated by implementing treatments when larvae have already metamorphosed into air-breathing adults (as proposed in these projects). Aquatic invertebrates are impacted by rotenone, though studies have shown they rapidly re-colonize treated stream reaches.

Rotenone in the proposed projects would be primarily applied to the stream with the use of drip stations that disperse a precise amount of diluted rotenone. Backpack sprayers would be used to help apply rotenone to areas of slow moving water. Potassium permanganate would be applied to the stream at the lower bounds of the projects to detoxify rotenone within a short distance (< 0.25 miles), thereby preventing impacts to lower reaches of the streams, and downstream waters. Neutralizing rotenone is discussed in more detail in the response to Issue 2 below.

Response to Rotenone Issues: The EA discussed the proposed rotenone application methods and the potential impacts of rotenone on human health and the environment. The specific rotenone issues expressed in the written comments were generally addressed in the EAs, and are also addressed below.

Rotenone and Parkinson's disease

> ***Response:*** The reported link between rotenone and PD is not a new issue, and the matter was discussed in the EA. The issue of PD and rotenone began with the publication of a study by Betarbet et al (2000), which reported that rotenone produced Parkinson's-like anatomical, neurochemical, and behavioral symptoms in laboratory rats when administered chronically and intravenously. However, the results of the study have been challenged on the basis of methodology: (1) that the continuous intravenous injection method used leads to "continuously high levels of the compound in the blood," and

(2) that dimethyl sulfoxide (DMSO) was used to enhance tissue penetration (normal routes of exposure actually slow introduction of chemicals into the bloodstream). In addition, injecting rotenone into the body is not a normal way of assimilating the compound. The most recent article by Tanner et al (2011)[1] entitled *Rotenone, Paraquat and Parkinson's Disease* provided evidence for a link between rotenone exposure and development of PD among private pesticide applicators. The study examined pesticide applicators (mostly farmers) and their spouses from Iowa and North Carolina. It found that among members of this group with PD 19% had used rotenone at least once, whereas among members of the group without PD 9% had used rotenone. This provides evidence that a link may exist between rotenone use and PD, but does not provide causal proof that using rotenone leads to PD. It is very important to note that the study examined only private pesticide applicators and their spouses, in other words, individuals likely to come into contact with undiluted pesticide products of all kinds. The article does not provide information on the specific rotenone products users had contact with, degree of training for rotenone use, product formulation (liquid or powder), duration of exposure, personal protective equipment worn during exposure, or other aggravating or mitigating factors affecting exposure. The study identifies among its limitations that most participants were exposed to many pesticides and effects of other agents cannot be excluded, nor can the possibility of results being due to exposure of combinations of pesticides. The study does not specifically address piscicides, beyond the generalization that rotenone is used as a piscicide, or therefore, the specific risks posed by piscicides. It seems unlikely, however, that farmers would routinely be exposed to piscicides and would more likely have been exposed to agricultural rotenone products no longer registered for use by the EPA.

From the foregoing discussion, there are reasons to doubt the validity of some of the results of these studies or the relevance to the kinds of exposure likely to occur during a piscicide treatment. Nonetheless, it underscores the need for applicators of rotenone products to institute procedures and protocols designed to ensure safety of workers and the public through minimal human exposure. The safe and effective use of pesticides is the responsibility of the EPA. During the recent reregistration process (2007) for piscicide formulation of rotenone, the EPA evaluated the link between PD and rotenone use, and concluded that human health would be protected if new modifications to the label and new Standard Operating Procedures (SOPs) were followed. These changes include changes to the PPE (personal protective equipment) used by applicators, requirements for deactivation of rotenone with potassium permanganate, restrictions on access to treatment areas by the public, monitoring requirements for water that is used for drinking, and stipulations on the types of equipment that may be used for dispensing rotenone. These required changes by EPA can be viewed online at http://www.epa.gov/oppsrrd1/REDs/rotenone_red.pdf. and the SOP manual is available through the American Fisheries Society at www.fisheries.org. Appendix B of the EA outlines the applicable treatment, neutralization, and safety procedures and SOPs that will be used for these projects.

[1]Tanner, C.M., F. Kamel, G.W. Ross, J.A. Hoppin, S.M. Goldman, M. Korell, C. Marras, G.S. Bhudhikanok, M. Kasten, A.R. Chade, K. Comyns, M.B Richards, C. Meng, B. Preistley, H.H. Fernandez, F. Cambi, D.M. Umbach, A. Blair, D.P. Sandler, and J.W. Langston. 2011. Rotenone, Paraquat and Parkinson's Disease. Environmental Health Perspectives; DOI: 10.1289/ehp.1002839

Rotenone movement in groundwater

Response: Comment 2f in the EA addressed this concern. As stated in the EA: No contamination of groundwater is anticipated to result from this project. Rotenone binds readily to sediments, and is broken down by soil and in water. Rotenone moves only one inch in most soil types; the only exception would be sandy soils where movement is about three inches. In California, studies where wells were placed in aquifers adjacent to and downstream of rotenone applications have never detected rotenone, rotenolone, or any of the other organic compounds in the formulated products. Case studies in Montana have concluded that rotenone movement through groundwater does not occur.

The impacts and consequences of rotenone use on mammals, birds and aquatic organisms

Response: These issues were extensively addressed in Comments 5b. and 5c. of the EA, and above. Any impacts to mammals and birds would be indirect through short-term changes in food abundance (fish and aquatic insects). Besides fish, other aquatic organisms that have gills (invertebrates and amphibians) could be impacted by rotenone. These impacts are considered short-term and minor for populations of aquatic invertebrates which have been shown to rapidly recolonize streams after rotenone treatments and to amphibians where the timing of treatments (late summer) will ensure that many larvae have metamorphosed into air-breathing adults.

Distance fish would be killed downstream of the treatments

Response: During the stream treatments, rotenone passing downstream of the lower bounds of the treatment area would be detoxified with the addition of potassium permanganate to the stream. Potassium permanganate fully detoxifies rotenone within 15 to 30 minutes of contact time, which for the proposed projects, equates to less than 0.25 miles of stream. Fish could be impacted, and potentially killed, in up to 0.25 miles of stream below the project reach, though it is more likely fish will only receive a lethal dose of rotenone in a much shorter stream reach.

Rotenone as an eye irritant

Response: Of primary concern relating to eye irritation would be to those persons applying concentrated rotenone to treated waters. This risk is minimized by FWP through training of applicators and the use of safety equipment (i.e., goggles). The potential for the general public to be exposed to eye irritating levels of rotenone would be eliminated by closing the application area to the public during the treatment. Further, due to its dilution in treated waters, rapid degradation, and neutralization process, rotenone persistence is expected to be short.

Necessity of rotenone use

Response: Rotenone is a highly effective tool for the removal of unwanted fish species in selected bodies of water, and has been used for this purpose in Montana since 1948. In the proposed projects, rotenone would be used to eradicate nonnative hybridized trout from portions of the South Fork 16 Mile Creek drainage in order to promote conservation and restoration of native WCT. In some areas of the South Fork of 16 Mile, electrofishing and genetic testing will be used to remove hybridized cutthroat trout.

Issue 2. There were several questions and concerns related to an unintended rotenone fish kill in the lower reaches of Cherry Creek (Madison River drainage) on August 4, 2010. For several potential reasons, described below, rotenone traveled farther than anticipated (3 – 4 miles) during the rotenone treatment on that day. This resulted in several thousand fish killed outside of the intended treatment area. At the time of the incident, potassium permanganate ***was not*** being applied to the stream to neutralize the rotenone.

What went wrong?

Response: Rotenone did not decay at the expected rate, causing it to travel farther downstream than had occurred during three previous applications at that same point. The degradation rate of rotenone was likely reduced by higher stream flow, cooler water temperature, and diminishing daylight. Rotenone persisted for about 12 miles, travelling about 3 – 4 miles beyond the project area. Because rotenone was not anticipated to travel as far as it did, the neutralization station which applies potassium permanganate to the stream was not turned on. Had the neutralization station been turned on, it would have completely neutralized the rotenone, preventing the unintended fish kill downstream. Active neutralization of rotenone did not fail during the Cherry Creek project. For example, two additional rotenone treatments were conducted in Cherry Creek 5 miles farther downstream after the August 4th accidental fish kill. In both cases neutralization stations successfully decayed rotenone as evidenced by the survival of sentinel fish placed in the stream downstream from the neutralization station. Also during the Cherry Creek project, in addition to the sentinel fish, we used a meter during every instance we applied potassium permanganate to measure the residual potassium permanganate concentration at 30 minutes flow time below the neutralization station. This gave us another measure of our effectiveness at neutralizing the rotenone and provided a quantifiable measurement so we could adjust the potassium permanganate concentration up or down as necessary so we didn't over-neutralize, which could affect non-target organisms and fish, or under-neutralize.

There has been no explanation from FWP

Response: An FWP news release describing the incident was issued on August 6, 2010, with follow-up articles in the Bozeman Daily Chronicle on August 10th and 14th, 2010, September 15th, 2010, and May 16th, 2011.

No new steps taken to prevent similar problems

Response: Since the problem at Cherry Creek, FWP developed a rotenone-application policy in 2011. This policy details conditions under which:

a.) active rotenone neutralization occurs prior to rotenone reaching the end of the treatment area,
b.) close monitoring of rotenone as it approaches the end of the treatment area
c.) when neutralization can cease.
Under subsection b sentinel fish must be posted at specific points within the project area and monitored. If certain of those sentinel fish show signs of rotenone toxicity, active neutralization must be initiated.

It could happen again

Response: Yes it could, but FWP is committed to eliminating as many variables as possible that could result in another incident, including implementation of the neutralization policy. FWP has learned from previous experiences and concludes that further unintended consequences from rotentone application are very unlikely.

FWP is going ahead without knowing the reasons

Response: please see the responses above.

Issue 3. There were several comments received concerning the value of the existing hybridized population and the risks that an introduction of new fish would not persist.

Response: Although FWP is confident that an introduced population could be successful after removal of the existing population and that FWP's preference under the initial proposal was to create a pure WCT population, FWP concedes that it is worth the additional time and expense in attempting to conserve and enhance the existing hybridized population. Therefore, FWP has modified the proposed action to selectively remove more highly hybridized fish, construct the fish passage barrier to eliminate continued invasion of rainbow trout (and other species), and not introduce genetically pure WCT for a period of 3 to 6 years. Evaluation of genetic changes will occur for 3 to 6 years to determine if a "Conservation Population" (>90% WCT genetics) can be restored throughout the project area.

Issue 4. There were several general comments concerning WCT conservation and management. Issues raised included nonnative species management, the extent of WCT and native species management, and the Endangered Species Act.

Response: FWP and Montanan's pride themselves on the quality of fishing and our predominantly wild, self-sustaining, and mostly nonnative trout fisheries throughout the state. People come from all over the country and world to fish waters like the Madison, Big Hole, and Beaverhead rivers that support wild and nonnative brown and rainbow trout, and the many reservoirs and lakes that are stocked with nonnative rainbow trout. Few would argue about the quality and importance of these nonnative fisheries. FWP and partner's WCT restoration and conservation in southwest Montana will focus on smaller tributary streams. FWP also understands that these smaller streams also provide important angling opportunities for families, including those seeking places to go that are not so crowded and where the chance to harvest fish is possible. FWP's goal is not to put things back the way they were with WCT in every stream. Such a goal would be impossible to accomplish and would not provide the diversity of fishing opportunities that make this part of the state such a great place to fish.

FWP will likely continue to propose WCT restoration projects into the future to ensure that WCT do not go extinct from their native range. The overall conservation goal stated in FWP's statewide fisheries management plan is that WCT be restored to approximately 20% of their historic distribution in each major river basin in the Upper Missouri River. In other words, 80% of the existing fish habitat will remain with nonnative trout populations. For example, there are over 100 tributary streams to the Big Hole River and nearly all contain non-native fisheries. Brook trout are present in most tributaries with some rainbow and some brown trout. In the next 20-30 years FWP will potentially propose to work in 15-25 streams where it is possible to restore native WCT in the Big Hole drainage. This leaves 75-85 small streams untouched and continuing to provide the existing fishing opportunities for brook trout and other nonnative fishes. This proportion would be typical in the Ruby and Beaverhead drainages as well. The major limiting factors for native fish restoration are creating fish barriers to prevent non-native fish from recolonizing the streams. FWP recognizes that these projects will impact fisheries that are important to some people, but it should also be noted that streams restored to WCT are still available to anglers. In summary, FWP is not trying to reestablish WCT in all of its historic distribution; FWP is only attempting to ensure that WCT occupy enough places, in healthy numbers, so they are a viable and relatively common species. FWP's data are very clear that if action is not taken to conserve WCT through projects similar to the proposed, WCT will disappear from the majority of the few places they remain in southwest Montana.

Currently, fishing regulations limit the streams in SW Montana to catch and release only for cutthroat trout. These regulations are in place because in almost all streams in Region 3 cutthroat trout are rare and in need of protection. It is anticipated that once WCT are restored to healthy numbers in some streams, like in the proposed projects, the catch and release regulations will be removed and limited harvest of WCT will be allowed. Recent data from the Big Hole also suggest that the native WCT can achieve a greater size than brook trout in some streams; therefore, potentially providing a better angling experience. Conservation of species like WCT is required by state law, and serves to prevent species from being listed under the federal Endangered Species Act. Title 87-1-201 (9)(i) of the Montana Code Annotated directs Montana Fish, Wildlife and Parks to manage wildlife, fish, game and nongame animals [and sensitive species section (9)(ii)] in a manner that prevents the need for listing under title 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq. Proposed work in the South Fork Sixteen Mile Creek reflects FWP carrying out duties as directed by Montana State Statutes. Without such actions, the status of WCT in Montana will continue to decline causing extirpation and potentially extinction; thereby losing an important ecological and cultural species, and increasing the likelihood of calls for listing of the subspecies under the Endangered Species Act.

Issue 5. There were several general and specific questions regarding project funding including questions on overall and specific costs, funding sources, and how these projects would take away from other programs.

Response: WCT conservation projects are part of the statutory duties of FWP. Funding of such efforts, including the proposed projects, come from a variety of sources. These

include standard FWP budgets (license dollars), cost-share agreements or direct assistance from our federal partners (e.g., U.S. Forest Service, and the Bureau of Land Management), and project specific grants from agencies and organizations (e.g., FWP's Future Fisheries Program, PPL Montana, U.S.Forest.Service., and Montana Trout Unlimited).

The cost of implementing WCT conservation projects varies greatly depending on site specific logistics. The primary costs are related to barrier construction, rotenone treatment supplies / equipment, personnel costs for the treatments, and costs associated with introductions of wild WCT.

At South Fork Sixteenmile Creek, the largest cost ($181,962) is related to constructing a fish passage barrier that will be effective during large flood events. The labor, materials, and mileage costs were estimated at $10,337 to implement the proposed action (Alternative 2) during 5 years of implementation (2014-2018). The revised alternative, which attempts to restore the genetics of the existing population without adding genetically pure individuals is estimated to be $17,663. If the revised alternative does not result in desired genetics of the WCT population (i.e., >90% WCT genetics), and Alternative 2 is implemented after evaluating the revised alternative, then total cost of labor, materials and mileage are estimated to be $28,000.

Issue 6. Concerns about "splitting hairs" when it comes to genetics of WCT conservation, and several verbal comments inquired about the difference between WCT and other similar fish species.

Response: Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) are 1 of 14 subspecies of cutthroat trout native to the interior of the western United States (Behnke 1992)[2]. In Montana, native WCT reside in the Columbia River drainage (west of the Continental Divide including the major basins of the Clark Fork, Flathead and Kootenai rivers) and east of the Continental Divide in the Hudson Bay and upper Missouri River drainages. WCT are morphologically and genetically different from other cutthroat subspecies, including Yellowstone cutthroat trout (YCT; *Oncorhynchus clarkii bouvieri*) that are native to Montana in the Yellowstone River drainage. FWP is not aware of any resource agency or organization that questions the classification of WCT as a unique cutthroat trout subspecies. Genetic analysis can be used to identify WCT and YCT, and to determine extremely low levels (< 1%) of hybridization between the species.

[2]Behnke, R. J. 1992. Native trout of Western North America. American Fisheries Society, Monograph 6, Bethesda, Maryland.

Issue 7. Concern over placing Washoe Park State Hatchery (Anaconda, MT) WCT east of the continental divide, and the need to receive direction from a conservation geneticist.

Response: Under the proposed modified alternative, fish will be introduced during the effort to restore the existing fishery to >90% WCT genetics. If this effort is not successful and the population needs to be replaced with a genetically pure population, the likely source of WCT will be from nearby population based on recommendations of FWP's conservation geneticist.

Issue 8. Concern over the survival rates of introduced WCT, and the preference to use eyed eggs rather than live fish for introduction.

Response: See Issue 3. Under the proposed modified alternative, no fish will be introduced for at least 3 to 6 years. If the existing population cannot be restored to >90% WCT genetics, introduction of either eyed-eggs or live fish from a pure source will be attempted after complete removal of all hybridized cutthroat trout from the project area. Based on the relatively healthy existing population, there is strong evidence that the habitat is suitable for survival of introduced fish from a similar stream environment.

Issue 9. There is no public benefit to these types of projects.

Response: The public will benefit from the presence of WCT by maintaining the opportunity to fish for and observe WCT, the state fish of Montana. Currently, WCT only occupy approximately 400 to 450 stream (around 5% of historic habitat) miles in the Upper Missouri River Basin, and the proposed project will increase that number by approximately 6 miles. If WCT continue to decline in the Upper Missouri River Basin, future residents and anglers will not get the benefit of the presence of this species. Nonnative trout occupy thousands of river miles in the Upper Missouri River basin, thus the removal of those hybridized cutthroat trout from the project area waters will not impact the ability of the public to benefit from their presence. Furthermore, projects that reduce the risk of an ESA listing may be considered a significant potential benefit to the nearby public.

Issue 10. Leave the South Fork the way it is.

Response: Title 87-1-201 (9)(i) of the Montana Code Annotated directs Montana Fish, Wildlife and Parks to manage wildlife, fish, game and nongame animals [and sensitive species; section (9)(ii)] in a manner that prevents the need for listing under title 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq. Proposed work in South Fork Sixteenmile represents FWP carrying out duties as directed by the Montana State Legislature. Without such actions, the status of WCT in Montana will continue to decline causing extirpation and potentially extinction east of the continental divide; thereby losing an ecologically and culturally important species.

Issue 11. What future changes in land management will be required if WCT are introduced?

Response: The habitat in South Fork is currently adequate and there are only minimal impacts of livestock grazing on the stream. No changes to existing land use management is needed to sustain this WCT fishery.

In a most general sense, FWP will always emphasize management practices that improve or maintain fish habitat because without the habitat there cannot be wild fisheries. In the case of westslope cutthroat trout conservation, habitat improvements alone will not result in the maintenance or improvement in the declining status of the species. This is because the most significant immediate threat to westslope cutthroat trout persistence is the presence of non-native species. Therefore, for meaningful cutthroat conservation to occur, both efforts to improve habitat and remove non-native species will be necessary.

Issue 12. Concern over federal land management in the South Fork.

Response: FWP R-3 actively works with its federal partners (e.g., the U.S. Forest Service and Bureau of Land Management) on many land management issues. Stream and watershed degradation is widespread from many historic and current land management activities, and can require decades to repair. In locations where active WCT conservation activities are occurring, special emphasis is given to reviewing and developing remediation plans for any specific land management concerns. FWP is satisfied that the U.S. Forest Service is managing the South Fork drainage in a manner consistent with WCT conservation.

Issue 13. You will upset the balance of the system and threaten a good fishery downstream.

Response: Achieving a balance between maintenance of sport fishing in the Sixteenmile drainage and restoring a reasonable genetic reserve of native cutthroat is one of FWP's primary goals for cutthroat trout conservation. Sixteenmile Creek is the only stream in the basin known to have maintained some nearly pure WCT. FWP has restricted the potential project area to this location primarily because downstream areas are privately owned land.

Issue 14. There is no way to ensure that the introduction of cutthroat will take**.**

Response: The presence of nearly pure WCT in the headwaters is the best indication that life history strategies of WCT are compatible with this system. If FWP proposed working on a stream that never had WCT, the suitability of the habitat would be questionable. As a result, FWP would generally be less confident in making the investment to reestablish natives. The presence of 4 major tributaries of the upper basin provides a variety of connected streams that provides additional security for long-term survival in case of a catastrophic event in the watershed. Existing habitat supports a hybridized WCT population year-round, and there is no reason a WCT population with less that 10% hybridization would not persist under the current habitat and land management regime.

Issue 15. Can introduced fish handle the stress of drought and low water?

Response: At least two commenters made this point and FWP lacked data to address this concern in 2013. Subsequently, FWP sampled the proposed project area each month during the summer of 2013 to evaluate the ability of existing fishery to survive low summer flows. FWP crews marked 583 fish above the proposed barrier location during early summer. They returned to the stream during late summer to evaluate if fish had moved downstream during the relatively hot, dry summer of 2013. Downstream of the proposed barrier, FWP sampled 254 fish in late summer (September 10th), and found no marked fish from upstream reaches. FWP also sampled upstream from the proposed barrier in late summer, and found a healthy population of fish in the proposed project area. Consistent with landowner observations, the density of rainbow trout and hybridized WCT was very high (80 to 100 fish per 100 meter section) downstream of the proposed barrier. FWP agrees that large numbers of fish reside in downstream reaches during periods of low summer flow. However, adequate habitat and significant numbers of fish remain in the upper reaches of the stream (40 to 50 fish per 100 meter section) and FWP found no evidence of fish out-migrating for thermal or flow refuge.

Issue 16. Concern that we might want to move downstream to expand the project in the future.

Response: Design and construction of the fish passage barrier is expensive and tailored to a specific location on the stream. If this investment is made to install a barrier about 2 miles upstream of private property it would be nearly impossible to justify the expense of a new structure at a downstream location. FWP has worked on two projects (Whites Creek and Muskrat Creek) where WCT populations increased substantially, which caused FWP to install better fish barriers. In both situations, the new barriers were placed near the original project boundary without expanding the projects downstream.
In addition, landowners were concerned that WCT migrating downstream of the project area to private lands could result in land use restrictions if the fish becomes federally listed. As the primary conservation threat to WCT is hybridization with nonnative trout, any WCT migrating downstream from the project area would lose their conservation value. The USFWS considers WCT populations to be of conservation value only when 80% of the genes represented in the population are from WCT. Therefore, a few WCT among mostly rainbow trout would not qualify for protection.

Issue 17. Concern regarding disturbance of the "pristine" nature of area.

Response: The primary disturbance related to the proposed project would occur during construction of the fish passage barrier. Construction equipment and concrete trucks may cause short-term disturbance of existing forest roads, which can be mitigated by seasonal timing and road maintenance. Temporary access using an existing closed road surface for approximately ¼ mile will require road reclamation, seeding, and weed control. The permanent concrete barrier will not be visible from existing roads.

Issue 18. Concern that the barrier will not function during spring run-off.

Response: Although it is true extreme flow events pose risks to fish barriers, the structure is designed to function during 100-year flood events. This design results in relatively high costs for a structure on a relatively small stream, but the high cost is largely related to the ability to withstand significant spring flooding. The barrier location in a confined stream reach adjacent to a bedrock outcrop was selected specifically for its suitability to pass flood events with low risk of lateral stream migration.

Issue 19. The mixed trout population is healthy and should have conservation value.

Response: The term "conservation value" specifically refers to fish with genetics >90% WCT and <10% rainbow trout). Although FWP agrees the existing fishery is healthy, valuable, and provides angling opportunity, it does not technically meet the definition of a WCT conservation population with >90 WCT genetics.

Issue 20. The proposal to introduce WCT into 16 other fishless streams in Region 3 should be done before replacing viable populations like South Fork and the FWP goal of 2,200 miles of WCT is not realistic. You have other projects going so you shouldn't go where you are clearly not wanted.

Response: Several potential projects to introduce WCT into fishless waters in the region have been identified. Although these projects are logistically easier because non-native fish do not need to be removed and a barrier is typically not needed, these projects sometimes are not successful because the barren habitat is not suitable to support a long

term fishery. In contrast, the South Fork has proven to support WCT hybrids for generations.

Issue 21. The piscicide treatment should only be done during late summer or early fall to reduce potential impacts, albeit limited, on amphibians. The EA says this is only recommended.

Response: FWP agrees and will only apply piscicide during late summer/early fall.

Issue 22. We recommend that FWP use eyed eggs for reintroduction, we oppose using gametes from the Washoe Fish Hatchery, and we recommend consultation with a conservation geneticist prior to identifying the genetic source.

Response: No fish will be introduced if the attempt to preserve a conservation population is successful. However, after 3 to 6 years of evaluation it is possible that introduction of genetically pure fish will be conducted if genetic recovery is not sufficient. FWP will consult with FWP's conservation geneticist and consider costs of using eyed eggs or live fish during potential future introductions.

Issue 23. Concerns about impact to ranchers downstream related to use of the chemical rotenone related to livestock.

***Response*:** Rotenone typically degrades rapidly through physical breakdown, photolysis, and natural oxidation in streams and shallow lakes. Rotenone passing the lower bounds of the treatment area would likely degrade naturally prior to reaching private lands. The proposed treatment includes active detoxification of rotenone with potassium permanganate. Detoxification efforts will continue until all rotenone has cleared from the South Fork. FWP and the USFS will work closely with lessees to minimize impacts to livestock operations. Moreover, FWP personnel will limit time in the South Fork Sixteen Mile Drainage to the minimum required for the treatment with rotenone. As stated in the Environmental Assessment, rotenone is not harmful to animals at the proposed treatment concentrations (up to 1 ppm active rotenone). The following language from the Environmental Assessment describes the effect of rotenone on mammals:

> Mammals are generally not affected because they neutralize rotenone by enzymatic action in their stomach and intestines (AFS 2002). Laboratory tests by Marking (1988) involved feeding a form of rotenone to rats and dogs as part of their diet for periods of six months to two years and observed effects such as diarrhea, decreased food consumption, and weight loss. He reported that despite unusually high treatment concentrations of rotenone in rats and dogs, it did not cause tumors or reproductive problems in mammals. Studies of risk for terrestrial animals found that a 22 pound dog would have to drink 7,915 gallons of treated lake water within 24 hours, or eat 660,000 pounds of rotenone-killed fish, to receive a lethal dose (CDFG 1994). The State of Washington reported that a half pound mammal would need to consume 12.5 mg of pure rotenone to receive a lethal dose (Bradbury 1986). Considering the only conceivable way an animal can consume the compound under field conditions is by drinking lake or stream water, a half-pound animal would need to drink 33 gallons of water treated at 2 ppm.

The EPA (2007) made the following conclusion for small mammals and large mammals;

> *When estimating daily food intake, an intermediate-sized 350 g mammal will consume about 18.8 g of food. Using data previously cited from the common carp with a body weight of 88 grams, a small mammal would only consume 21% (18.8/88) of the total carp body mass. According to the data for common carp, total body residues of rotenone in carp amounted to 1.08 μg/g. A 350-g mammal consuming 18.8 grams represents an equivalent dose of 20.3 μg of rotenone; this value is well below the median lethal dose of rotenone (39.5 mg/kg * 0.350 kg = 13.8 mg = 13,800 μg) for similarly sized mammals. When assessing a large mammal, 1000 g is considered to be a default body weight. A 1000 g mammal will consume about 34 g of food. If the animal fed exclusively on carp killed by rotenone, the equivalent dose would be 34 g *1.08 μg/g or 37 μg of rotenone. This value is below the estimated median lethal equivalent concentration adjusted for body weight (30.4 mg/kg * 1 kg = 30.4 mg = 30,400 μg). Although fish are often collected and buried to the extent possible following a rotenone treatment, even if fish were available for consumption by mammals scavenging along the shoreline for dead or dying fish, it is unlikely that piscivorous mammals will consume enough fish to result in observable acute toxicity.*

Final Environmental Assessment for the EA titled: South Fork Sixteenmile Creek Westslope Cutthroat Trout Recovery.

There is a modification to the Draft Environmental Assessment based on public comment. The Draft Environmental Assessment, together with this Decision Notice, will serve as the final documents for these proposals.

Description of the modified alternative:

The preferred alternative (Alternative 2) for the South Fork Sixteenmile Creek restoration project was to construct a fish passage barrier, completely remove a hybridized population of westslope cutthroat trout (WCT) using rotenone, and reintroduce genetically pure WCT from a neighboring WCT stream. Based on public comments received during two public meetings, and from written comments received from 14 individuals and organizations, Montana Fish, Wildlife & Parks and the Gallatin National Forest have modified the proposed restoration project. Some downstream landowners were opposed to complete removal of the existing hybridized fishery and replacement with genetically pure fish. In response to this concern, FWP proposes to secure a portion of the existing fishery without attempting to completely replace this fishery with alternative sources of genetically pure WCT.

Past genetic testing has shown a gradation in hybridization, where fish in the downstream end of the project area have higher levels of hybridization and lower levels of hybridization are present in the upstream portions. Some small sections of the upstream headwater tributary streams contained westslope cutthroat with less than 10% introgression. FWP's preference is to

reestablish pure populations of WCT where possible; however, FWP and other agencies do recognize WCT populations with less than 10% hybridization as conservation populations. It is possible to remove the more highly hybridized fish in sections of the project area, and then allow refounding from fish with less than 10% hybridization. This approach can fail by not getting the majority of fish with more than 10% hybridization out of the system. Further, if the number of remaining 90% pure fish is low, there is a risk of inbreeding depression and founder effects. Given the public comment, FWP is willing to attempt this modification as an alternative to securing WCT in the area. The steps needed to secure and enhance the existing population include:

1) Install fish passage barrier to stop future invasion of non-native trout such as rainbow and brown trout (rainbow trout are currently moving into the project area and brown trout are located approximately 2 miles downsteam of the project area); COST: $181,962,

2) Remove fish appearing to be significantly hybridized using selective electrofishing sampling in areas with the least hybridized component of the existing fishery. Genetic testing may be used to retain cutthroat over 90% pure and remove those under 90% pure.;

3) Remove all fish in selected reaches of stream where hybridized fish are dominant using chemical treatments. Although electrofishing removal of highly hybridized fish is possible the cost and time would be at least an order of magnitude higher. Many public comments were concerned with the cost of the project; thus, FWP will use rotenone to keep costs down and to increase the likelihood of success;

4) Allow existing fish with >90% WCT genetics to re-colonize existing habitat without introducing new fish;

5) After two generations (approximately 3 to 6 years) determine success of this modified approach through genetic testing, for obtaining a conservation population having 90% or more westslope cutthroat genes. Evaluate the need for modifying future population management at this time. Coordination with landowners and other interested parties will take place prior to other techniques for obtaining the goal of 90% or greater westslope cutthroat genes in the population.

If, after 3 to 6 years of attempting to recover the conservation population there is insufficient progress in restoring the genetics of the WCT population, FWP will proceed with complete removal of the existing population and reintroduction of genetically pure WCT. This will be done as described in Alternative 2 of the draft EA. Progress of the project evaluation will be reported to area landowners and the interested public, and these parties will be informed of proposed changes in project direction.

Decision

Based on the Environmental Assessment, public comment, and the need to conserve westslope cutthroat trout in the South Fork Sixteenmile Creek drainage of SW Montana, FWP will proceed with the modified alternative.

I find there to be no significant impacts on the human and physical environments associated with this project. Therefore, I conclude that the Environmental Assessment is the appropriate level of analysis, and that an Environmental Impact Statement is not required.

Patrick J. Flowers
Region Three Supervisor